CLAIMS

What is claimed is:

1. A rivet assembly, comprising:

a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and

a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge,

wherein the at least one cutting edge is suitable for incrementally shaving material from the work piece as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve.

2. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge comprises a leading cutting edge and a trailing cutting edge formed on opposite sides of the groove.

3. The rivet assembly as claimed in claim 2, wherein the leading cutting edge extends outwardly from a longitudinal axis of the auger further than the trailing cutting edge.

4. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge is parallel to a longitudinal axis of the auger.

5. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge forms an angle with respect a longitudinal axis of the auger.

6. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge is curved.

7. The rivet assembly as claimed in claim 1, wherein the groove further forms at least one polishing edge suitable for polishing the aperture created by said at least one cutting edge.

Sub a2 > 8. The rivet assembly as claimed in claim 7, wherein the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.

9. The rivet assembly as claimed in claim 8, wherein the leading polishing edge extends outwardly from a longitudinal axis of the auger further than the trailing polishing edge.

Sub a3 > 10. The rivet assembly as claimed in claim 7, wherein the at least one polishing edge is parallel to a longitudinal axis of the auger.

11. The rivet assembly as claimed in claim 7, wherein the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.

12. The rivet assembly as claimed in claim 7, wherein the at least one polishing edge is curved.

13. The rivet assembly as claimed in claim 1, wherein the auger comprises a tip suitable for self-tapping the aperture.

Sub a4 > 14. The rivet assembly as claimed in claim 13, wherein the tip includes a point suitable for piercing the work piece, the point extending into a cutting tooth for removing work piece material.

15. The rivet assembly as claimed in claim 1, wherein the auger further comprises a thread for pulling the auger through the work piece.

16. The rivet assembly as claimed in claim 15, wherein the auger includes a tapered polishing portion having at least one polishing edge, and wherein the thread blends into the polishing portion.

17. The rivet assembly as claimed in claim 1, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

18. The rivet assembly as claimed in claim 1, wherein the mandrel further comprises a shoulder section adjacent to the auger, the shoulder section having an outer diameter greater than the inner diameter of the hollow tubular sleeve, the shoulder section being suitable for radially compressing and spreading the hollow tubular sleeve as said mandrel is retracted, and a shank having an area of reduced diameter spaced rearward from the shoulder section and sized for allowing the auger and shoulder section to be detached upon application of predetermined tensile force to the shank.

19. The rivet assembly as claimed in claim 18, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve, wherein the area of reduced diameter is positioned substantially flush with an end of the bolt head after the auger and shoulder section are detached so that a length of the shank remains in the rivet body.

20. A rivet assembly, comprising:

a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and

a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting and at least one polishing edge;

wherein the at least one cutting edge is suitable for incrementally shaving material from the work piece and as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve, and

wherein the at least one polishing edge is suitable for polishing the aperture created by said at least one cutting edge.

21. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge comprises a leading cutting edge and a trailing cutting edge formed on opposite sides of the groove.

22. The rivet assembly as claimed in claim 20, wherein the leading cutting edge extends outwardly from a longitudinal axis of the auger further than the trailing cutting edge.

23. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge is parallel to a longitudinal axis of the auger.

24. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge forms an angle with respect to a longitudinal axis of the auger.

25. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge is curved.

26. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.

27. The rivet assembly as claimed in claim 26, wherein the leading polishing edge extends outwardly from a longitudinal axis of the auger further than the trailing polishing edge.

28. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge is parallel to a longitudinal axis of the auger.

29. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.

30. The rivet assembly as claimed in claim 29, wherein the at least one polishing edge is curved.

31. The rivet assembly as claimed in claim 20, wherein the auger comprises a tip suitable for self-tapping the aperture.

32. The rivet assembly as claimed in claim 31, wherein the tip includes a point suitable for piercing the work piece, the point extending into a cutting tooth for removing work piece material.

33. The rivet assembly as claimed in claim 20, wherein the auger further comprises a thread for pulling the auger through the work piece.

34. The rivet assembly as claimed in claim 20, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

35. The rivet assembly as claimed in claim 20, wherein the mandrel further comprises a shoulder section adjacent to the auger, the shoulder section having an outer diameter greater than the inner diameter of the hollow tubular sleeve, the shoulder section being suitable for radially compressing and spreading the hollow tubular sleeve as said mandrel is retracted, and a shank having an area of reduced diameter spaced rearward from the shoulder section and sized for allowing the auger and shoulder section to be detached upon application of predetermined tensile force to the shank.

Sub A7> 36. A rivet assembly, comprising:

a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and

a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein for forming means for cutting material from the work piece,

wherein the cutting means is suitable for incrementally shaving material from the work piece as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve.

37. The rivet assembly as claimed in claim 36, wherein the groove further forms means for polishing the aperture created by the cutting means.

38. The rivet assembly as claimed in claim 36, wherein the auger further comprises means for self-tapping the aperture.

39. The rivet assembly as claimed in claim 36, wherein the auger further comprises means for pulling the auger through the work piece.

40. The rivet assembly as claimed in claim 36, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

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